

NAME:

DATE:

## Mastery Assessment of Unit 2 (Practice version 107)

### Question 1

Let  $f$  represent a function. If  $f[11] = 40$ , then there exists a knowable solution to the equation below.

$$y = 6 \cdot \left( f \left[ \frac{x}{2} - 4 \right] - 32 \right)$$

Find the solution.

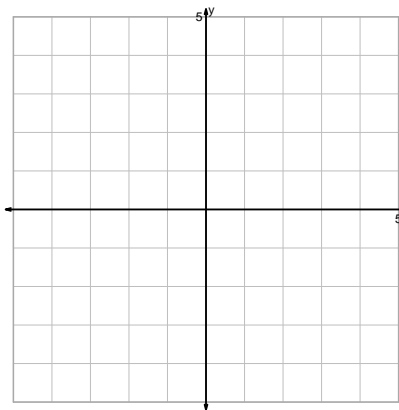
$$x =$$

$$y =$$

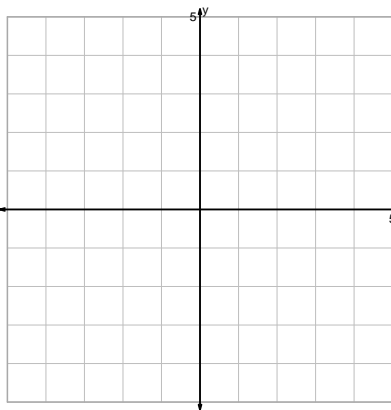
### Question 2

Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.

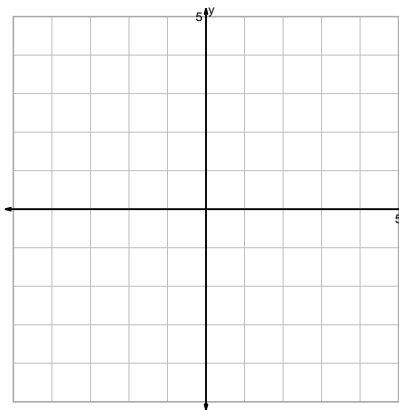
$$y = \sqrt[3]{x} + 2$$



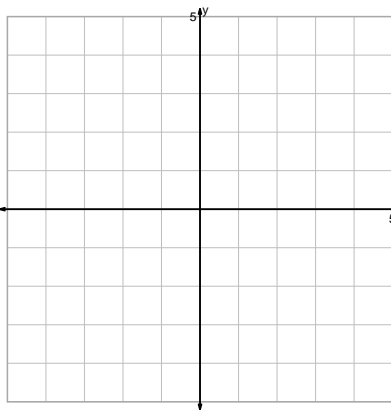
$$y = \sqrt{2x}$$



$$y = \left( \frac{x}{2} \right)^2$$

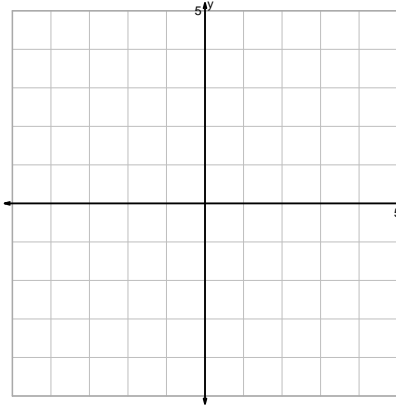


$$y = 2^{-x}$$

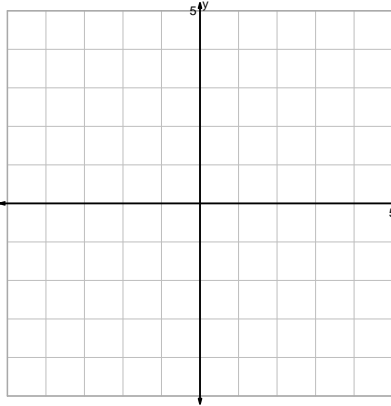


Question 2 continued...

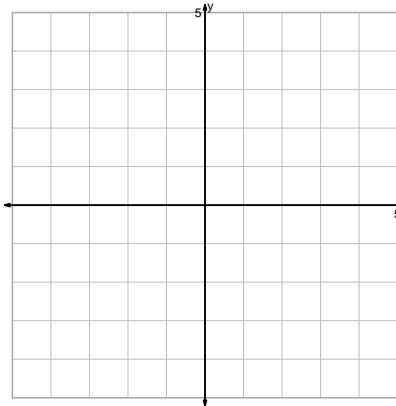
$$y = (x+2)^2$$



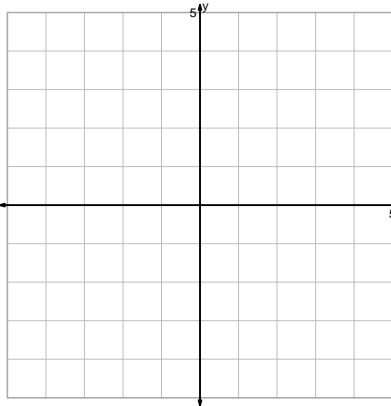
$$y = -\log_2(x)$$



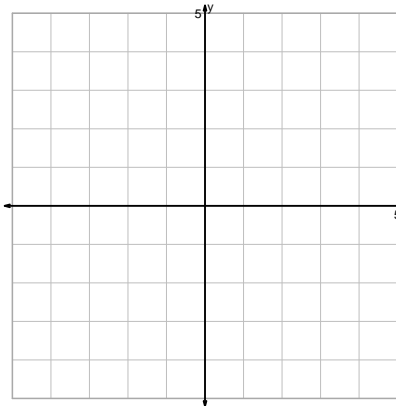
$$y = 2 \cdot \sqrt[3]{x}$$



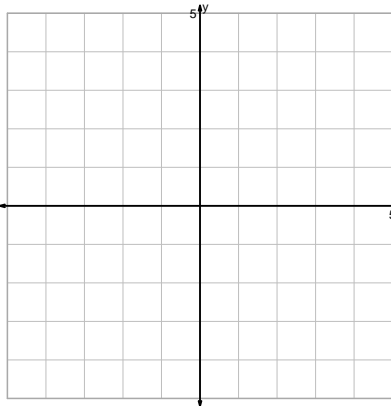
$$y = 2^x - 2$$



$$y = (x-2)^3$$

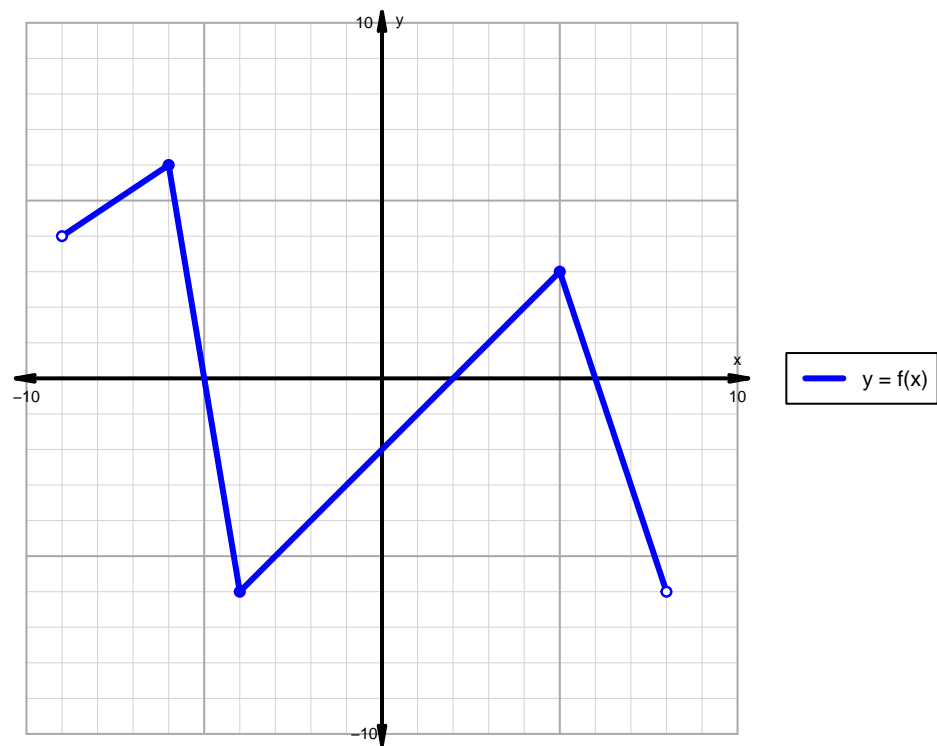


$$y = \frac{\log_2(x)}{2}$$



Question 3

A function is graphed below.



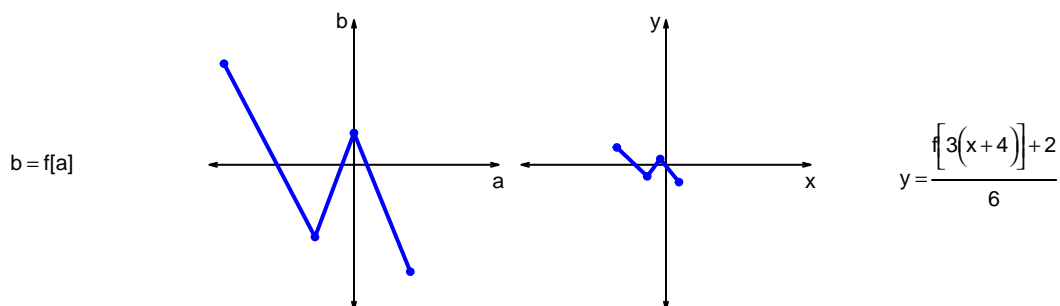
Indicate the following intervals using interval notation.

Feature	Where
Positive	
Negative	
Increasing	
Decreasing	
Domain	
Range	

#### Question 4

Let  $f$  represent a function. The curves  $b = f[a]$  and  $y = \frac{f[3(x+4)]+2}{6}$  are represented below in a table and on graphs.

a	b	x	y
-90	70	-34	12
-27	-50	-13	-8
0	22	-4	4
39	-74	9	-12



- a. Write formulas for calculating  $x$  from  $a$  and calculating  $y$  from  $b$ . (Or, write the coordinate transformation formula.)

- b. What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve  $y = f[x]$  into the second curve  $y = \frac{f[3(x+4)]+2}{6}$ ?

### Question 5

A parent square-root function is transformed in the following ways:

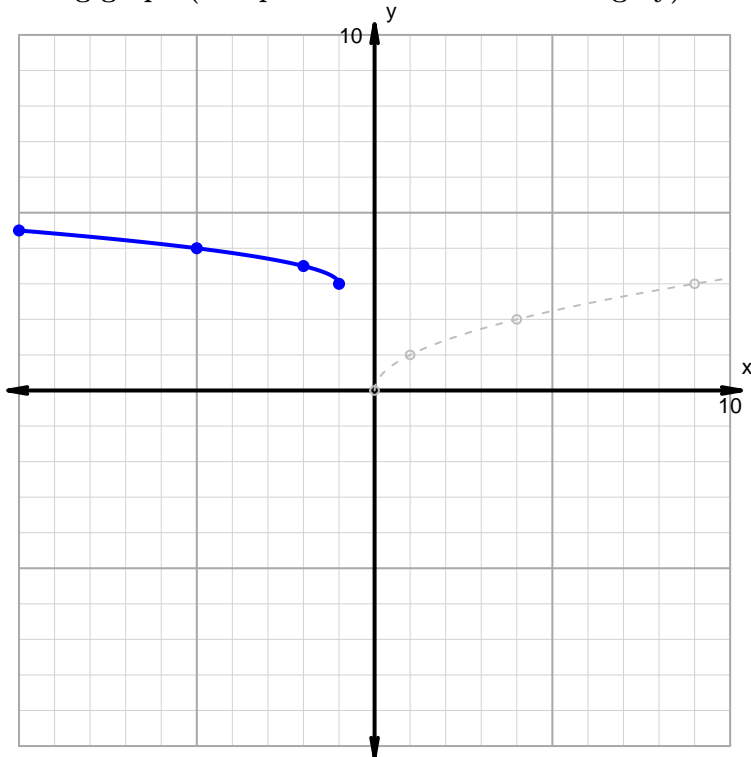
#### Horizontal transformations

1. Horizontal reflection over  $y$  axis.
2. Translate left by distance 1.

#### Vertical transformations

1. Vertical shrink by factor 2.
2. Translate up by distance 3.

Resulting graph (and parent function in dashed grey):

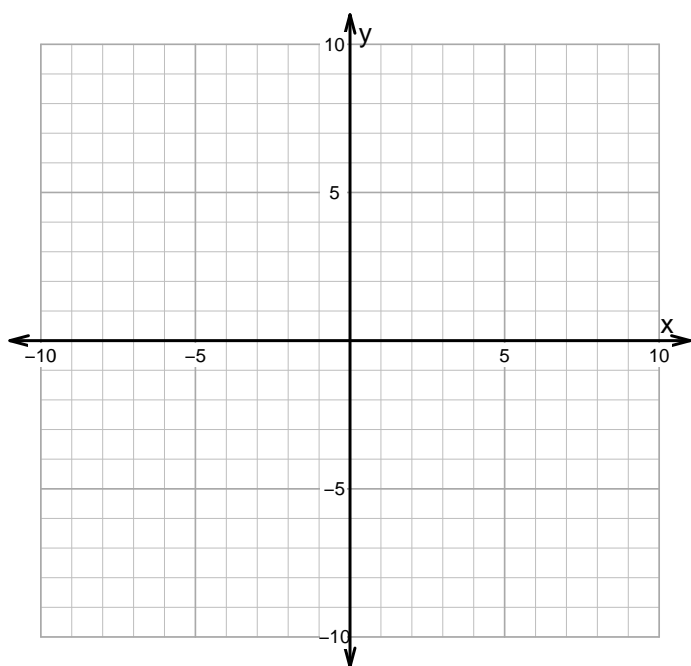


- What is the equation for the curve shown above?

### Question 6

Make an accurate graph, and describe locations of features.

$$y = 2 \cdot |x + 2| - 4$$



Feature	Where
Domain	
Range	
Positive	
Negative	
Increasing	
Decreasing	